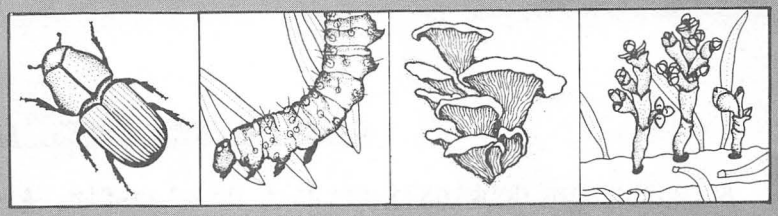
Cooperative Forestry & Pest Management



Report No. 83-22 December 1983

EVALUATION OF PROPOSED DWARF MISTLETOE PROJECTS ON THE LOLO NATIONAL FOREST, MONTANA

by

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ABSTRACT

Residual Douglas-fir, western larch, and lodgepole pine are dwarf mistletoe-infested and pose a threat to existing regeneration. Felling or girdling these residuals, along with sanitation/thinning, will reduce mistletoe intensity and increase future volume yields. Present net worth of the project is $48.05/acre. Benefit cost ratio is 1.97/1. Use of pest management funds is recommended.

INTRODUCTION

The Lolo National Forest has proposed presuppression surveys on 7,035 acres, and suppression projects on 1,044 acres on the Missoula, Plains/Thompson Falls, Seeley Lake, and Superior Ranger Districts.

I visited some of these or very similar areas during the 1983 field season:

June 23 - Plains/Thompson Falls, with George Weldon and Doug Shaner.

September 13 - Missoula, with Vick Applegate and Gary Lynam.

September 15 - Seeley Lake, with Renee Lundberg.

September 16 - Superior, with Doug Bergland, Debbie Reynolds, and Jay Smith.

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CAUSAL AGENTS, HOSTS, AND DAMAGE

Arceuthobium douglasii attacks Douglas-fir, A. laricis attacks western larch, and A. americanum attacks lodgepole pine. Dwarf mistletoe infection causes a reduction in tree vigor, height, and diameter growth, along with some mortality. Volume loss estimates in infested Douglas-fir and western larch types are about 20 cubic feet per acre per year.[1] Volume loss in infested lodgepole pine type on the Lolo NF is 6.9 cubic feet per acre per year.[1] This does not include losses to other pathogens and insects in trees made vulnerable by mistletoe.

PRESUPPRESSION SURVEYS

Presuppression surveys are designed to gather data on the amount of dwarf mistletoe by host species and infection intensity. These data are used to help prescribe stand treatment. While use of Forest Pest Management funds for these surveys is legitimate, such surveys are normally given a lower priority than direct suppression projects.

SUPPRESSION PROJECT DESCRIPTIONS

For the Lolo project, suppression involves varying degrees of thinning intensities and/or species selection criteria when treating a stand. Thinning may range from cutting only selected individual trees to a heavy removal because of more severe mistletoe infections. Girdling of residual or overstory trees is also included.

Missoula RD.--The project plan calls for slashing mistletoe-infested Douglas-fir and lodgepole pine residuals in three regenerated stands on 279 acres. I did not visit these units, but they are similar to some I did see on September 13.

Plains/Thompson Falls RD.--The project consists of two stands containing 160 acres; Swamp Creek, 68 acres; and Nancy Creek, 92 acres. I visited Swamp Creek on June 23. The original stand of Douglas-fir and ponderosa pine was cut in 1969, but some overstory trees were left. The overstory was recently removed, but some mistletoe-infested Douglas-fir still remains. Armillaria mellea root disease is causing some center-type mortality in the residual Douglas-fir. The stands will be managed primarily for ponderosa pine, but some Douglas-fir will be favored outside the root disease centers.

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[1] Dooling, O. J. and R. G. Eder. 1981. An assessment of dwarf mistletoes in Montana. USDA Forest Service, Northern Region. Forest Pest Management Report 81-12.

Seeley Lake RD.--The project plan calls for slashing or girdling about 470 acres of scattered mistletoe-infested lodgepole pine overstory. I visited four of these units on September 15. All units were logged from 10 to 20 years ago, apparently with little regard for mistletoe. Although several tree species are present, only the lodgepole pine is mistletoe-infested. Plans call for leaving nonsusceptible species where possible.

Superior RD.--This project consists of 135 acres of sanitation/thinning in nine stands. Four of these stands were proposed for the 1983 project, but were not funded. I visited five of these stands on September 16. Mistletoe-infested Douglas-fir, western larch, and lodgepole pine overstory and understory are scattered on parts of all stands.

Phaeolus schweinitzii root and butt disease is evident on one unit, and A. mellea root disease mortality is present in advanced regeneration around old stumps in four of the units. Future stand damage should be minimum because the more disease tolerant species (pines and larch) are to be left as crop trees.

MANAGEMENT ALTERNATIVES

1. Defer treatment.--Potential yields would be considerably less than those expected if the stands were treated.

2. Remove mistletoe-infested residuals; thin/sanitize existing regeneration.--Potential yields would be increased because this would largely eliminate mistletoe from susceptible species.

3. Convert to nonsusceptible species.--Potential yields would be increased, even though in some cases this would not be as silviculturally desirable as maintaining a diversified stand containing susceptible species. In some areas this would also forego accumulated growth of the stand.

PREFERRED TREATMENT

Preferred treatment is a mix of alternatives 2 and 3.

ECONOMIC ANALYSIS

Economic analysis is based on these data:

Control costs	$49.30/acre
Years to product - thin	70
harvest	90
Yield, no treatment - thin	0 MBF/acre
- harvest	7 MBF/acre
Yield, treatment - thin	3 MBF/acre
- harvest	15 MBF/acre
Stumpage	$45/MBF
Discount rate	4%

Lodgepole pine

Year	Volume without treatment (MBF/acre)	Volume with treatment (MBF/acre)	Benefit of treatment (MBF/acre)	Benefit value at harvest[1] ($/ac)	Present value of benefit[2] ($/ac)	Project cost ($/ac)
0	-	-	-	-	-	49.30
70	0	3	3	539.93	34.66	-
90	7	15	8	2,139.52	62.69	-
	7	18	11	2,679.45	97.35	49.30

[1] Last 5 years' stumpage value of $45/MBF increased at 2 percent compound interest.

[2] Harvest value discounted to present at 4 percent.

Present net worth is the difference between present value of benefits and project costs: $48.05/acre. Benefit cost ratio is 1.97/1. Increasing stumpage values over time make the project economically feasible.

DISCUSSION

Recovery of volume losses through dwarf mistletoe control generates additional employment in the forest products industry and result in "value added." While value added cannot be used in an economic analysis, it is usually substantial enough to be considered when determining overall benefits. Each million board feet of timber cut creates 7.3 person years of employment, paying an average of $18,500 per person per year.[2] For the proposed project, this increased employment amounts to 0.08 year in 2074, and would add $1,480 to the economy for each acre in the treatment area.

This project shows a positive return for the investment, but not all projects do. In those cases where the return is not positive, overall benefits such as reducing or eliminating mistletoe for more than a single rotation, and increasing present and future employment, often outweigh strict financial considerations.

Control also protects other investments such as costs for site preparation, planting, and timber stand improvement.

RECOMMENDATIONS

Reduction of dwarf mistletoe impact through silvicultural practices is both biologically and economically sound. I recommend the use of pest management funds for the project.

Because control will be by felling or girdling scattered cull trees from areas already essentially clearcut, and thinning of overstocked stands, there will be no additional adverse impact on other resources. This project is neither major nor controversial, and does not need an environmental analysis.

[2] Personal communication; Charles Keegan and Paul Polzin, Bureau of Business and Economic Research, University of Montana, Missoula, MT.